CLAIMS

What is claimed is:

1. In a non-detachable press fit arrangement between an end portion of a metal pipe and a socket of a fitting, with the socket defining an interior space and being formed with an annular anchoring groove facing the interior space for receiving a sealing ring, said press fit arrangement comprising at least one holding element secured to the socket and cold formed together with the socket, said holding element at least partially penetrating the material of the end portion of the metal pipe to realize a positive fit with the metal pipe.

2. The press-fit arrangement of claim 1 wherein the socket is formed adjacent the anchoring groove for the sealing ring with an annular receiving groove facing the interior space for receiving the holding element, said holding element being provided with a material penetrating component for realizing the positive fit between the holding element and the end portion of the metal pipe when cold forming the socket of the fitting, said component being selected from the group consisting of projections spaced about the circumference of the holding element and pointing in the direction of the end portion of the metal pipe, and a cutting edge arranged about the circumference of the holding element and extending to the end portion of the metal pipe.

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3. The press-fit arrangement of claim 1 wherein the holding element is a ring formed with an axial slot.

4. The press-fit arrangement of claim 3 wherein the ring-shaped holding element has a cross section selected form the group consisting of vertex of a triangle, curved and polygonal.

5. The press-fit arrangement of claim 2 wherein the receiving groove has a conical base, said holding element having a cross sectional contour which complements the conical base, and including a free edge of small diameter for penetration into the end portion of the metal pipe after radially compressing the socket.

6. The press-fit arrangement of claim 2 wherein the holding element is mounted by way of a positive fit into the receiving groove.

7. The press-fit arrangement of claim 2 wherein the holding element is resiliently mounted into the receiving groove.

8. The press-fit arrangement of claim 1 wherein the holding element is arranged between the sealing ring and a free end of the fitting.

9. The press-fit arrangement of claim 1 wherein the socket of the fitting has an outer peripheral surface formed with an engagement member selected from the group consisting of circumferential groove, lobes, ribs and circumferential fins for attachment of a press tool.

10. The press-fit arrangement of claim 9 wherein the press tool is a wraparound chain.

11. The press-fit arrangement of claim 1 wherein the socket of the fitting is substantially round after being compressed, with sealing forces and holding forces applied between the socket and the end portion of the metal pipe being substantially evenly distributed about the circumference of the metal pipe.

12. The press-fit arrangement of claim 1 wherein the holding element is a ring having one side, which faces the sealing ring, and an opposite side, said one side being formed with projections which penetrate into the material of the metal pipe when being cold formed, and said opposite side being formed with a conical surface which cooperates with a conical surface of the fitting.

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13. The press-fit arrangement of claim 2 wherein the holding element is a sleeve which is slotted in the axial direction and formed with an anchoring flange engaging in the receiving groove of the socket, said holding element traversing an annular gap formed between an end face of the fitting and the end portion of the metal pipe to extend outwards for surrounding the metal pipe, whereby through application of a press tool a portion of the holding element is capable to dent the metal pipe.

14. The press-fit arrangement of claim 13 wherein the portion of the holding element has an inner surface formed with teeth.

15. The press-fit arrangement of claim 1 wherein the socket has an end face forming an entry opening for the end portion of the metal pipe, said socket being formed in close proximity to the end face with a ring-shaped receiving groove which is open to the outside for receiving an anchoring flange of the holding element, said holding element being an axially slotted sleeve which surrounds the metal pipe and partially dents the material of the metal pipe.

16. The press-fit arrangement of claim 15 wherein the sleeve has an inner surface formed with teeth.

17. The press-fit arrangement of claim 1 wherein the anchoring groove is formed in a bead of the socket, said holding element being formed as a stepped sleeve having a first portion of smaller diameter and a second portion of greater diameter, with the second portion overlapping the bead of the socket, and with the first portion surrounding the metal pipe, wherein the holding element matches an outer contour of the socket after being compressed, with the first portion of the stepped sleeve denting the material of the metal pipe.

18. The press-fit arrangement of claim 1 wherein the holding element has a hardness exceeding a hardness of the metal pipe.

19. The press-fit arrangement of claim 1 wherein the holding element is made of special steel.

20. The press-fit arrangement of claim 1 wherein the sealing ring is a seal selected from the group consisting of lip seal, O ring or matched formed part.

21. The press-fit arrangement of claim 1 wherein the sealing ring has a relatively small cross section.

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